

**WHAT IS CLAIMED IS:**

- 1           1.       An interference-aided signal acquisition and tracking system comprising:  
2                   a vehicle having at least two receivers configured to detect external  
3 signals, the at least two receivers having an output dependent on attitude of the vehicle;  
4                   an interference detector that measures the output of at least one of the at  
5 least two receivers;  
6                   a noise canceller that combines the output of the at least two receivers; and  
7                   a signal processor that extracts a desired signal from the output of the  
8 noise canceller, wherein the output of the interference detector is used to control the noise  
9 canceller as to reject unwanted signals and enhance performance of the signal processor  
10 in extracting the desired signal.
- 1           2.       The system of claim 1, wherein the vehicle is a missile.
- 1           3.       The system of claim 1, wherein the interference detector comprises a  
2 rotation tracker that provides a rotation estimate.
- 1           4.       The system of claim 3, wherein the noise canceller comprises an  
2 interference cancellation controller that applies modulations to null an interference signal  
3 as a function of the rotation estimate.
- 1           5.       The system of claim 1, further comprising phase modulators.
- 1           6.       The system of claim 1, wherein the interference detector comprises an  
2 analog intensity detector.
- 1           7.       The system of claim 1, wherein the interference detector and noise  
2 canceller are embodied in programmed instructions in a rotation preprocessor.
- 1           8.       The system of claim 1, wherein the noise canceller modulates to null  
2 interference in the detected external signals.

1           9.     A method of signal acquisition and tracking comprising:  
2                 receiving external signals at a spinning vehicle;  
3                 measuring the received external signals;  
4                 modulating the received external signals to null an interference signal; and  
5                 extracting a desired signal from the combined external signals.

1           10.    The method of claim 9, further comprising providing a rotation estimate of  
2     the rotation of the spinning vehicle.

1           11.    The method of claim 9, wherein modulating the received signals to null an  
2     interference signal comprises combining the measured external signals and rejecting  
3     unwanted signals.

1           12.    The method of claim 9, further comprising correcting phase of an output  
2     signal from the modulation for rotation effects.

1           13.    The method of claim 9, wherein modulating the received external signals  
2     is performed on a pre-satellite basis using satellite geometry information.

1           14.    A signal acquisition and tracking system where interference is cancelled  
2     for jamming immunity with spinning vehicles operating in interference environments, the  
3     system comprising:  
4                 a number of signal receivers associated with a spinning vehicle;  
5                 a rotation tracker that obtains signals from the number of signal receivers  
6     and provides a rotation estimate;  
7                 a global positioning system (GPS) processor that provides satellite  
8     geometry information; and  
9                 an interference cancellation controller that obtains the rotation estimate  
10    and the satellite geometry information and modulates to null interference received by the  
11    number of signal receivers.

1           15.    The system of claim 14, wherein the signal receivers are antennas on a  
2     missile.

1           16.     The system of claim 14, wherein the modulation done by the interference  
2     cancellation controller is done on a per-region-of-sky basis.

1           17.     The system of claim 14, wherein the modulation done by the interference  
2     cancellation controller is done on a per-satellite basis.

1           18.     The system of claim 14, wherein the interference cancellation controller  
2     corrects the phase of the signals from the number of signal receivers for rotation effects.

1           19.     The system of claim 14, wherein the interference cancellation controller  
2     predetermines modulation commands as functions of roll and pitch angles.

1           20.     The system of claim 14, wherein the rotation tracker and interference  
2     cancellation controller are implemented by an application specific integrated circuit  
3     (ASIC).